

**APPENDIX 4-A****STORAGE OF MANGANESE ORE  
(Synthetic Battery Grade)***1. Description*

a. Battery grade manganese ore, frequently referred to as manganese dioxide, synthetic battery grade is a black material in the form of small lumps and fines. It may be received for storage in the following grade:

(1) Synthetic Grade A

b. This type of manganese differs from the metallurgical grade in that it has a higher manganese-dioxide content and lower impurities. It is an important constituent of dry cell batteries. When acquired, battery grade manganese ore shall meet Purchase Specification P-29-R (Current Edition).

*2. Packaging*

a. Synthetic grade ore will be received in polyethylene bags inside 55-gallon, 16-gauge steel drums weighing 700 to 1,000 pounds net each, conforming to the requirements of the National Stockpile Container Specification C-1 (latest revision). All containers comprising a shipment lot will be of the same general size and shape. Some material presently in storage is in fiberboard drums weighing 125 pounds net each. Any future repackaging authorized by the DNSC will replace these fiberboard drums with the painted C-1 (latest revision) drums.

*3. Marking*

a. Drums are to be identified with three metal tags. One tag to be attached to the outside of the lid, one on the inside of the lid, and one attached to the drum side. Information on the tags will be as instructed on the purchase contract and purchase specification.

b. Two metal embossed pile signs with the pile number, material name, country of origin and major elements as specified by the DNSC-OL shall be placed at each end of the pile.

*4. Storage*

a. Natural Grades A and B are to be stored in the open on an improved surface equivalent to Type C, as described in Chapter 4 of this Storage Manual. Material will be segregated into piles by country of origin and grade, or in the case of domestic material, by grade and producer. To prevent losses by action or wind, or rain, piles of fines shall be covered according to specifications provided by the DNSC-OL.

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**STORAGE OF MANGANESE ORE  
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- a. *Health.* Dust should be minimized during receipt and/or outloading this material.
- b. *General.* Drummed material must be kept free of contamination and moisture. Drums have waterproof paper liners or polyethylene liners to prevent ores from touching metal. Drum covers must be drawn up tight to prevent air moisture from causing deterioration of paper liners or oxidation of the inside metal face of the drums.

*6. Average Storage Factor*

- a. *Volume.*
  - (1) *In Container.* 16 cubic feet per short ton.
- b. *National Stockpile Average Square Foot Occupancy.*
  - (2) *Warehouse.* 5.4 gross square feet per short ton.

*7. Shipping Requirements.*

- a. Manganese Dioxide, Synthetic Battery Grade can not be shipped overseas as packaged. Purchaser or purchaser's agent must repack, mark & label containers in accordance with CFR 49 - Transportation and Packaging of Hazardous Materials for Oxidizing Solid, n.o.s., (Manganese Dioxide), 5.1, UN1479, PG-III.
- b. All conus shipments of material shall conform with 49 CFR-Transportation and Packaging of Hazardous Materials for Oxidizing Solid, n.o.s., (Manganese Dioxide), 5.1, UN1479, PG-III. Material shall conform to requirements of {49 CFR 173.240} pertaining to sift-proof containers.
  - (1) *Vehicle.*

Vehicle must be a closed van. Vehicle must be for exclusive use; this should be conveyed to the dispatcher.
  - (2) *Shipping Weight.*

Minimum weight requirements for sift-proof containers, net weight of shipment must be at least 8,900 lbs.
  - (3) *Placarding.*

{49 CFR 172.500} - The purchaser or purchaser's agent will ensure the proper placarding of the transport vehicle (Oxidizer) on each side and each end of the transport vehicle. Placarding must

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include “UN 1479” {49 CFR 172.332(d)} or the number “1479” must be on an orange rectangular panel adjacent to the placard {49 CFR 172.332(b)}.

(4) *Shipping Papers.*

{49 CFR 172.200} - The purchaser or purchaser's agent will provide shipping papers with information to include, but not limited to:

- a. 1 Trailer (Bulk) Oxidizing Solid, n.o.s., (Manganese Dioxide), 5.1, UN1479, PG-III \_\_\_\_\_ lbs. Net
- b. An emergency response number and accompanying documentation in accordance with the guidelines of 49 CFR 172.600.
- c. The shipper's certification statement and a signature from the person certifying the load as per 49 CFR 172.204. (Depot personnel will not be certifying the loads)
- d. **“Exclusive Use of Vehicle”** shall be annotated on all shipping papers
- e. DNSC will complete and provide a copy of the DLA/DNSC drum inspection certification to be attached to the shipping documents.

FOR ADDITIONAL INFORMATION ON THIS COMMODITY REFER TO THE MATERIAL SAFETY DATA SHEET OR THE MOST RECENT PURCHASE SPECIFICATION.